WHAT IS CLAIMED IS:

1. A method for producing an image of an object utilizing a computed tomography (CT) imaging system, said method comprising:

axially scanning an object utilizing the CT imaging system to obtain more than 180° of projection data of the object;

weighting the projection data according to projection location and pixel location in an image to be reconstructed; and

reconstructing the image of the object utilizing the weighted projection data.

2. A method in accordance with Claim 1 wherein said weighting the projection data according to the projection data comprises reducing the weighting of contributions of projections 180° apart to reconstructed image pixels.

3. A method in accordance with Claim 2 wherein weighting the projection data comprises applying a weight $w(\phi-\theta)=w(\alpha)$ defined by a relationship written as:

$$w(\alpha)=\begin{cases}1-3\left|\frac{\alpha}{\eta}\right|^2-2\left|\frac{\alpha}{\eta}\right|^3, & \text{if } |\alpha|\le\eta\\ 1, & \text{otherwise,}\end{cases}$$

wherein η is a parameter that specifies a transition region;

ϕ is an angle of an image pixel in a polar coordinate system; and

θ is the projection angle.

4. A method in accordance with Claim 3 wherein $\eta=\pi/4$.

5. A method in accordance with Claim 3 wherein said reconstructing an image of the object utilizing the weighted projection data comprises reconstructing the image in accordance with a relationship written as:

$$f(r,\phi,z) = \int_{\phi-\Gamma}^{\phi+\Gamma}\int_{-\infty}^{\infty} w(\phi-\theta)P(\omega,\theta,z')|\omega|e^{j2\pi\omega t}\,d\omega\,d\theta$$

wherein Γ is a parameter that specifies the projection data range used in the reconstruction, and $\Gamma > \pi/2$.

6. A method in accordance with Claim 5 wherein Γ is a function of image slice location relative to a center plane of a fan beam of a radiation source of the CT imaging system.

7. A method in accordance with Claim 6 wherein Γ is larger for image slices closer to the center plane.

8. A method in accordance with Claim 5 wherein $\eta = \pi/4$.

9. A method in accordance with Claim 1 wherein said reconstructing an image of the object utilizing the weighted projection data comprises utilizing polar coordinates for said image reconstruction.

10. A method for producing an image of an object utilizing a computed tomography (CT) imaging system, said method comprising:

axially scanning an object utilizing the CT imaging system to obtain more than 180° of projection data of the object;

weighting the projection data according to projection location; and

reconstructing an image of the object utilizing the weighted projection data in a Cartesian coordinate system.

11. A method in accordance with Claim 10 wherein weighting of a projection for a part of an image closest to a radiation source of the CT imaging system is less than the weighting of the other half of the image.

12. A method for producing an image of an object utilizing a computed tomography (CT) imaging system, said method comprising:

axially scanning an object utilizing the CT imaging system to obtain more than 180° of projection data of the object;

selecting a range of projections in accordance with locations of pixels of an image of the object to be reconstructed; and

reconstructing the image of the object utilizing the selected range of projections.

13. A method in accordance with Claim 12 wherein selecting a range of projections comprises selecting a range of projections between $\phi - \pi/2$ to $\phi + \pi/2$, wherein ϕ is a polar angle of said pixels.

14. A computed tomography imaging system having a detector array and an radiation source, wherein to produce an image of an object, said system is configured to:

axially scan an object to obtain more than 180° of projection data of the object;

weight the projection data according to projection location and pixel location in an image to be reconstructed; and

reconstruct the image of the object utilizing the weighted projection data.

15. A system in accordance with Claim 14 wherein to weight the projection data according to the projection data, said system is configured to reduce the weight of contributions of projections 180° apart to reconstructed image pixels.

16. A system in accordance with Claim 15 wherein to weight the projection data, said system is configured to apply a weight $w(\phi-\theta)=w(\alpha)$ defined by a relationship written as:

$$w(\alpha)=\begin{cases}1-3\left|\frac{\alpha}{\eta}\right|^2-2\left|\frac{\alpha}{\eta}\right|^3, & \text{if } |\alpha|\le\eta\\ 1, & \text{otherwise,}\end{cases}$$

wherein η is a parameter that specifies a transition region;

ϕ is the angle of an image pixel in a polar coordinate system; and

θ is the projection angle..

17. A system in accordance with Claim 16 wherein $\eta=\pi/4$.

18. A system in accordance with Claim 16 wherein to reconstruct an image of the object utilizing the weighted projection data, said system is configured to reconstruct the image in accordance with a relationship written as:

$$f(r,\theta,z)=\int_{\phi-\Gamma}^{\phi-\Gamma}\int_{-\infty}^{\infty}w(\phi-\theta)P(\omega,\theta,z')|\omega|e^{j2\pi\omega t}d\omega d\theta$$

wherein Γ is a parameter that specifies the projection data range used in the reconstruction, and $\Gamma>\pi/2$.

19. A system in accordance with Claim 18 wherein Γ is a function of image slice location relative to a center plane of a fan beam of the radiation source of the CT imaging system.

20. A system in accordance with Claim 19 wherein Γ is larger for image slices closer to the center plane.

21. A system in accordance with Claim 18 wherein $\eta = \pi / 4$.

22. A system in accordance with Claim 14 wherein to reconstruct an image of the object utilizing the weighted projection data, said apparatus is configured to utilize polar coordinates for said image reconstruction.

23. A computed tomography imaging system having a detector array and an radiation source, wherein to produce an image of an object, said system is configured to:

axially scan an object to obtain more than 180° of projection data of the object;

weight the projection data according to projection location; and

reconstruct an image of the object utilizing the weighted projection data in a Cartesian coordinate system.

24. A system in accordance with Claim 23 wherein weighting of a projection for a part of an image closest to a radiation source of the CT imaging system is less than the weighting of the other half of the image.

25. A computed tomography imaging system having a detector array and an radiation source, wherein to produce an image of an object, said system is configured to:

axially scan an object to obtain more than 180° of projection data of the object;

select a range of projections in accordance with locations of pixels of an image of the object to be reconstructed; and

reconstruct the image of the object utilizing the selected range of projections.

26. A system in accordance with Claim 25 further configured to select said range of projections between $\phi - \pi/2$ to $\phi + \pi/2$, wherein ϕ is a polar angle of said pixels.